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THE GENUS TRisetum IN AMERICA.¹

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IN the present article, the writer has only in view a brief sketch of a more comprehensive work which will soon be published as a contribution from the Dept. of Botany of the University of Montreal; just enough to validate the publication of certain changes in the systematic treatment of our American species of the genus *Trisetum*.

In a short "Introduction," the writer declares he is following the rules of the International Congress of Vienna. In the FIRST PART, he discusses briefly the following topics:

Chapter I. General discussions.

Art. 1.—Organographic description of the spikelet, and terminology of its component parts: glumes, lemma, palea, lodicules.

Art. 2.—On the occurrence of cleistogamous spikelets.

Art. 3.—A recommendation on the use of histotaxy.

Chapter II. The geographical distribution of the genus in America.

Art. 1-7.—Terra del Fuego. Chili. Argentina. Peru. Brasil. Bolivia. Ecuador. Mexico. United States. Canada. Alaska.

Chapter III. Evolution of the conception of the genus *Trisetum*.

Art. 1.—History of the genus *Trisetum*.

Art. 2.—Actual definition and divisions of the genus.

Under this article, is given the author's description of the genus *Trisetum* taking in account the relations of *Trisetum* with the neighboring genera; it is worthy to be reproduced here in extenso:

¹ A THESIS submitted by the writer to the Division of Biology (Dept. of Botany) of Harvard University, in partial fulfillment of the requirements for Ph.D.

TRISSETUM Persoon.

Spikelets 2-12-flowered, mostly 3; in a loose, more or less spike-like panicle, narrowly cylindrical, sparsely-flowered to subglobose-compact, erect or cernuous; flowers perfect, larger at base, becoming gradually smaller, the terminal one rudimentary, often reduced to a hairy bristle. Glumes 2, awnless, herbaceous, glabrous, rarely chartaceous, pilose, sometimes isomorphous (of the same length, breadth, equally nerved), mostly heteromorphous: I 1-nerved, rarely 3-nerved, II 3-nerved, rarely 1-nerved; linear-lanceolate to broad-ovate, longer or shorter than the spikelet, often equal, dorsally keeled, scabrous, ciliate or glabrous. Lemma narrow-lanceolate to broad-ovate, subulate or keeled, 5-nerved, rarely 3- or 7-nerved, mostly chartaceous, punctate-scabrous, villous, pubescent, puberulent or glabrous, rarely herbaceous, entire, scariosus, 2-dentate, 2-lobed or 2-fid at the apex: segments sharp or acuminate, sometimes ending with two bristles, sometimes subdivided laterally, awnless or dorsally awned: awn (1-12 mm. long.) not reduced to a beak, mostly long, straight or more or less twisted, divaricate or flexuous, geniculate or bent. Palea hyaline, shorter than lemma, sometimes its equal, rarely longer, 2-keeled: keel glabrous or ciliate, smooth or scabrous, more or less (0.3-1 mm.) distant; 2-fid, 2-toothed or scariosus at the apex, inclosing with the lemma the caryopsis. Lodicles 2, ovate, entire or differently divided. Stamens 3, anthers (0.2-3.2 mm. long) ovoid to narrow-cylindrical. Ovary glabrous, rarely hairy at the apex; styles 2, terminal or nearly so; stigmata 2, plumose, sessile or subsessile. Caryopsis completely sheathed, free, fusiform, sometimes compressed laterally, rarely grooved on the inside; scar of hilum punctiform to linear-elliptic. Rachis, callus, rachilla and its prolongation differently pilose. Rachilla usually articulated above the glumes.¹

¹ TRISSETUM PERSOON. Spiculis sesqui- usque multifloris, lateraliter compressis, in paniculam aut amplam, plus minusve contractam vel apertam, aut spiciformem, cylindrico-angustam, paucifloram vel globoso-compactam, cum intermediis formis multis, erectam vel cernuam; floribus hermaphroditis, superioribus tabescentibus ultimo in pedicellum plerumque villosum, saepe rudimento terminatum. Glumis 2, muticis, herbaceis, glabris, chartaceis, raro pilosis; aliquando perfecte isomorphis (i. e. aequilongis, aequilatis, parinerviis), generaliter heteromorphis: I 1-nervia, lineari-lanceolata (raro 3-nervia), II 3-nervia; lineari-lanceolata usque ovata-lata; longiores vel breviores quam spicula, saepe spiculam aequantes; carinatae, scabrae, ciliatae vel glabrae in carina media. Lemmate lanceolato-angusto usque ovato-lato, subulato vel carinato, 5-nervio (raro 3- vel 7-), plerumque chartaceo, punctato-scabro, villoso, pubescente vel puberulente, raro herbaceo, glabro; apice subintegro, scarioso, bidentato, bilobo vel bifido: segmentis acutis, acuminatis vel setulatis, lateraliter aliquando subdivisis; mutico vel dorsaliter aristato: arista (1-12 mm. longa) in mucronem reducta vel longa, recta vel plus minusve tortili, divaricata vel flexuosa, geniculata vel recurvata. Palea hyalina, lemmati brevior, aliquando aequali, raro longiore; bicarinata: carinis glabris vel ciliatis, laevibus vel scabris, plus minusve (0.3-1 mm.) distantibus; apice bifida, bidentata vel scariosa; laterales partes extracarinales caryopsis amplectantes. Lodicae 2, ovaes, subintegrae vel diverso-incisae. Stamina 3, antheris (0.2-3.2 mm. long.) linearibus plus minusve crassis usque ovalibus. Ovarium glabrum vel apice comosum; styli 2, terminales vel subterminales;

In the following enumeration, the American valid species, varieties and forms are given with citations, descriptions and discussions when necessary; the species are loosely grouped by a key emphasizing the most important characters.

For more details, readers are referred to the original paper actually in the Widener Library at Harvard. The whole matter will be published in the Contributions of the Université de Montréal in the near future.

Sub-genus I. **HETEROLYTRUM** Louis-Marie.

Section 1. ANAULACOA Louis-Marie.

Sub-section 1. EUTRISETA (E. Desv.) Louis-Marie. Ut sectio ab E. Desvaux apud C. Gay, Flora Chilena 6: 346. 1853; Asch. & Graebn., Syn. 2: 263. 1899.

A. *Panicle terminal; culm simple...* B.

B. *Panicle loose, more or less opened, long-branched...* C.

C. *Culm reed-like, strong (1-3 m. high).*

1. TRisetum VIRLETHI Fourn., Mex. Pl. Enum., Gram. 108. 1886.
2. TRisetum BAMBUSIFORME Fourn., Mex. Pl. Enum., Gram. 108. 1886.
3. TRisetum PANICULATUM Fourn., Mex. Pl. Enum., Gram. 109. 1886.
4. TRisetum SPLENDIDULUM Steud., Syn. Pl. Gram. 229. 1854.
5. TRisetum IRAZUENSE (Kuntze) Hitch., Proc. Biol. Soc. Wash. 40: 82. 1927.

C. *Culm not reed-like; herb (0.3-1.2 m. high) less strong...* D.

D. *Ovary glabrous at the tip.*

6. TRisetum FRAUDULENTUM Steud., Syn., Pl., Gram. 424. 1854.
7. TRisetum MALACOPHYLLUM Steud., Syn., Pl. Gram., 229. 1854.
Calamagrostis Cumingii Nees, Steud., Syn. Pl. Gram. 1854.
Calamagrostis Lechleri Steud., Syn. Pl. Gram. 1854.
8. TRisetum FLAVESCENS (L.) Beauv., Agrost., 88, t. 18, f. 1. 1812.
9. TRisetum MONTANUM Vasey. Bull. Torr. Bot. Club. 13: 118. 1886.

TRisetum MONTANUM Vasey, var. **pilosum**, var. n. A typo differt vaginis conspicue pubescentibus, rachillae flexiore villositate, longiore articulo terminali sparse villosa, non glabro, et praecipue lemmate inferius plus minusve pubescente.

Differing from the type by the conspicuous pubescent sheaths, the soft villosity of the rachilla, the longer terminal pedicel sparsely villous, not glabrous, and especially by the lemma more or less pubescent at the base.

Distribution. NEW MEXICO: near Caroles, Alt. 3200 ft. July 26, 1908, P. C. Standley, No. 4536 (TYPE at the Gray Herbarium); Windsor Creek, Alt. 8500 ft. July 28, 1908, P. C. Standley No. 4576.

TRISETUM MONTANUM Vasey, var. **Shearii** (Scribn.), comb. n.—
Trisetum Shearii Scribn. Circ. U. S. Div. Agrost. **30**: 8. 1901.
Trisetum argenteum Scribn. Bull. U. S. Dept. Agr. Div. Agrost.
11: 49, fig. 8. July 20, 1898; non *T. argenteum* R. & S., 1817;
 non Schur, 1860. *Grapphephorum Shearii* Rydb., Bull. Torrey
 Bot. Club **32**: 62. 1905.

D. Ovary hairy at the tip.

10. TRISETUM CERNUUM Trin., Mém. Acad. St. Pétersb. (Sér. VI) **1**:
 61. Jan. 1830.

The type from Sitka is perfectly glabrous; blades 4–5 mm. wide; glumes very unequal: the superior short-acuminate; spikelets mostly with 2 perfect flowers. This type occupies the northern part of the range only: Alaska, British-Columbia, Washington.

Going South, we meet two variations important enough to be thus systematically distinguished:—

TRISETUM CERNUUM Trin., var. **luxurians**, var. n. Culmo valido (fere 1 m. alto), glabro vel glabrato, laminis foliorum (lat. 8–10 mm.) latissimis; spiculis habitualiter 3-floris, saepe 4-floris, rachillae articulis longioribus, gluma inferiore valde reducta (long. 1 mm.).

Culm almost 1 meter high, glabrous or nearly so; blades very (8–10 mm.) broad; spikelets 3–4-flowered; nodes of rachilla more distant; inferior glume very reduced, often 1–2 mm. long.

Distribution. WASHINGTON: Upper Valley of the Nesqualley, 8 Sept. 1893, *O. D. Allen*, No. 42. IDAHO: Hills, July 25, 1898, *C. V. Piper*, No. 2814. OREGON: Shaded rocks below falls, Silver Creek Falls, June 19, 1918, *J. C. Nelson*, No. 2244; *Shear & Scribner* (1705), TYPE at U. S. Nat. Herb. No. 86797. CALIFORNIA: Cloverdale, Sonoma Co., June 1867, State Survey, No. 6465b; Big Trees, Yosemite, 1866, *H. N. Bolander*, No. 6172.

TRISETUM CERNUUM Trin., var. **LUXURIANS** Louis-Marie, forma **pubescens** forma n. A varietate differt plus minusve densa vaginarum pubescentia.

Differing from the variety by its pubescent sheaths.

Distribution. OREGON: St. Helen, May 1880, *T. J. Howell*, No. 350; Gearhart, Aug. 1901, *A. S. Hitchcock*; Bridal Veil, Multnomah Co. 1910, *H. H. Smith*, No. 3048. CALIFORNIA: Eureka, Humboldt Co., May 30, 1920 (TYPE), Herb. Univ. Calif. No. 212883; Woodland, Mendocino Co., May 1866, No. 6122; Humboldt Bay, Alt. 100 ft. May, 1901, *H. P. Chandler*, No. 1176.

Discussion. The second variation is the transformation of the superior glume which, from broad-oval and short-acuminate in the typical *T. cernuum*, has a tendency to become rather narrow-oval

and long-acuminate. One would think that, in the section where the two geographic areas of *T. cernuum* and *T. canescens* meet, certain intermediates appear which explain, in a certain way, why botanists have tried to make of *T. canescens* Buckl. a variety of *T. cernuum*. The following variety, based upon the type of a species placed as a synonym under *T. cernuum*, would group around it the major part of the intermediate plants, "ratione glumae secundae," between two species which, starting from two poles, run in opposite ways.

TRISETUM CERNUUM Trin., var. **Sandbergii**, comb. n. *T. Sandbergii* Beal, Grasses N. Amer. 2: 378. 1896. A typo differt panicula angustiore, lineari; spiculis dorsaliter magis cylindraceis, saepius purpureo flavoque variegatis, gluma inferiore ovalilanceata, nunquam reducta, floribus majoribus.

Differing from the type by its narrower linear panicle; by its spikelets less keeled and less dorsally compressed, almost purple; by its inferior glume oval-lanceolate, never reduced; by its larger flowers.

Distribution. WASHINGTON: Mount Stuart, alt. 7000-8000 ft., *Sandberg et Leiberg*, No. 823 (TYPE). OREGON: Mountain Stream Banks, alt. 13,000 ft., June 28, 1900, *W. C. Cusick*, No. 2426.

11. **TRISETUM CANESCENS** Buckl. Proc. Acad. Sci. Phila., 100. 1862.

Discussion. In December 1861, and January and February 1862, appeared, under the signature of S. B. Buckley, an important contribution to the flora of Texas: 160 new plants were described, 57 belonging to the Gramineae family. I will not undertake to appraise the value, even in a general way, of such a work which certainly has some merit. It is impossible, however, in publishing an historical sketch of *T. canescens*, not to point out to what degree natural aversion may vitiate the critical judgment of otherwise very competent minds.

Asa Gray did not like Buckley; it seems even that he hated him conscientiously. At all events, he lost no time in answering to the three insufferable memoirs. After opposing a "reductio ad nihilum" to the two first publications of Buckley's work, he concludes thus:

"It will be perceived that all the new genera of Mr. Buckley's two papers, and nearly all the new species, are either oversights or mistakes, which might have been avoided . . . However excellent the author's intentions, we can only regret a publication which entails upon our science a hundred worse than useless synonyms,

(a regret which I have reason to believe Mr. Buckley now shares), and we should endeavor to prevent future calamities of the kind. In this regard, understanding that a third paper of the sort, upon a peculiarly difficult order of plants, has been printed in the Academy's Proceedings, but yet not issued, I am confident that my motives will not be misunderstood when I venture to suggest, that the credit both of the Academy and of the author of the paper, no less than the interests of science, would be most subserved by the cancelling of the sheets."

Buckley published in February his "Description of Plants, No. 3 Gramineae." Gray immediately responded: "I hold myself responsible for the statements herewith presented. If some of my comments be thought severe, it should be understood that Mr. Buckley was duly warned of the injury he was about to inflict upon science . . ."

And here is how Asa Gray scores the new species of Buckley! Suffice it to quote a few examples:

"*Glyceria leptostachya* and *G. microtheca* are both alike, and both Nuttall's MSS. names, which Mr. Buckley has appropriated in the coolest manner writing 'Buckl.' after the name upon Nuttall's autograph tickets."

"*Glyceria montana*. Another appropriation of a MSS. name of Nuttall. Could Nuttall complain, however, he should transpose the words of the poet and say, 'He that filches my *good name* steals trash'; for the species is 'poor indeed.'"

"*Poa tenuifolia*—still another of Nuttall's unblushingly appropriated—."

"*Trisetum canescens* is the more hairy-leaved and striate form of *T. cernuum*, Trin., described from the specimen of '*T. elatum*' Nutt., which name Mr. Buckley has erased from the ticket, for no obvious reason (as the name is a good one), except to give some variety in form to his depredations."

"Happily Mr. Buckley has spared the *Paniceae* and the *Andropogineae*; for which, in the interest of all American botanists, I tender him my sincere thanks."

These outbursts, too passionate to be always fair, sometimes, missed the point: they place the great compilers in a complex attitude, prejudice the judgment of monographers yet insufficiently familiar with the plants they describe. The authors of *Kew Index*¹ placed

¹ *Index Kewensis*, 2: 1123. 1895.

T. canescens in the synonymy. Beal¹ made it a variety of *T. cernuum* Trin.

It is somewhat baffling to one who looks into the material of the large herbariums, to find under the same cover specimens with sheaths really canescent, others quite glabrous, and it seems a little ridiculous to be forced to add to the species *T. canescens* a forma *tonsum*.

Buckley's type has been consulted at the Academy of Sciences of Philadelphia²; it consists actually of a strong panicle (25 cm. long, 4-5 cm. wide); glumes unequal: I 6 mm. long, 1-1.5 mm. wide, II 7 mm. long, 2 mm. wide; lemma (7-8 mm. long, 2 mm. wide) awned dorsally about $\frac{1}{4}$ from the top; awn 7-8 mm. long; palea 6 mm. long; rachilla (3-4 mm.) very long; anthers 1.6-1.8 mm. long.

Taking into account the existing laws of nomenclature, the name given by Buckley is to be maintained, even if it is not a proper one. Since 1862, it has been accepted as valid by a number of eminent botanists.

The typical *T. canescens* is nearer *T. flavescens* than *T. cernuum*. It is different by its more rigid habit, by its panicle not flavescent, by the hairy tip of its ovary, by its ligule 2 or 3 times longer. In certain specimens where this last character alone is clearly visible, the affinity becomes more obvious, and one may question if there are really two different species. The ovary hairy at the tip of *T. canescens* forbids any reduction.

T. CANESCENS Buckl., forma **tonsum**, forma n. A typo differt glabrietate perfecta partium omnium.

Differing from the type by being completely glabrous.

Distribution. CALIFORNIA: "*Trisetum elatum* Nutt." Sierra Nevada, alt. 5000 ft. *Bolander & Kellogg*, 1872; Rush Creek, Trinity Co., June 10, 1914, *Harry S. Yates*, collector's No. 411; Davis Creek, July 5, 1894, *Davy*; Buckeye Mt., Trinity Co., July 15, 1914, *Harry S. Yates*, collector's No. 522 (TYPE in U. of California) "an unusually glabrous form."

T. CANESCENS Buckl., forma **velutinum**, forma n. A typo differt vaginis tantum vel vaginis laminisque dense velutinis.

Differing from the type by its leaves densely velvety.

¹ Beal, *Grasses of North America*, 2: 380. 1896.

² Gray's following remark: "*T. canescens* is the more hairy leaved and striate form of *T. cernuum* . . ." leaves one under the impression that when he studied that type, the specimen was a complete one. This mutilation of the type is to be regretted; now one cannot appreciate to what extent the sheaths of the present species ought to be canescent. There is left, to judge of the nature of the pilosity, but the original description.

Distribution. CALIFORNIA: "*Trisetum elatum*" Lassen's Peak, July 1879, *Mrs. R. M. Austin* (TYPE at the Gray Herbarium). The *Trisetum cernuum* Trin., Woods, Foot-Hills of Olympia Range, June 27, 1902, *J. M. Grant* is very velvety, but with flexuous branches. *J. B. Davy & W. C. Blasdale's* No. 5965 is nearly glabrous.

B. *Panicle contracted with appressed, more or less short branches...* E.
E. *Blades filiform; panicle linear-lanceolate.*

12. *TRISETUM FILIFOLIUM* Scribn., Beal, Grasses N. Amer. 2: 375. 1896.

TRISETUM FILIFOLIUM Scribn., var. *ARISTATUM* Scribn., Beal, Grasses N. Amer. 2: 375. 1896.

E. *Blades plane or folded; not filiform...* F.

F. *Panicle cylindrical, subinterrupted.*

13. *TRISETUM HETERONYMUM* Steud., Syn. Pl. Gram. 229. 1854.

F. *Panicle not cylindrical...* G.

G. *Ovary hairy at the tip.*

14. *TRISETUM HIRTUM* Trin., Linnaea 10: 300. 1836.

G. *Ovary not hairy at the tip.*

15. *TRISETUM projectum*, sp. n. Culmis caespitosis (30–90 cm. alt.), subfragilibus, infra strictis, supra cernuis; foliis albo-velutinis; vaginis inferioribus dense velutinis, superioribus glabratis, laxis, caulinis saepius 3; ligula 1.5–2 mm. long. pubescente, denticulata, iterum fimbriata; foliorum laminis magis velutinis ad paginam inferiorem (4–10 cm. long., 2–2.5 mm. lat.), planis vel involutis; panícula exserta (10–15 cm. long., 1–2 cm. lat.), disjuncta saltem inferius, inflorescentiae segmentis projectis, viride pallido vel albescente, nitida; radiis simplicibus vel divisis, perbrevibus vel 1.5–3 cm. longis, a basi floriferis; spiculis bifloris, lateraliter compressis, tempore antheseos apertis (6–7 mm. long.); glumis inequalibus, ovato-lanceolatis, in carina ciliatis, spiculam fere aequantibus: I angustiore (5–5.2 mm. long., 1–1.2 mm. lat.), uninervia, II (6–6.5 mm. long., lat. 1.6–1.8 mm.) trinervia; lemmate glabro-laevi, non punctato-scabro, lanceolato (6 mm. circ. long., 1–1.2 mm. lat.), 5-nervio, bifido, bisetulato, in tertia parte circiter superiore aristato; arista divaricata (5–6 mm. long.), vix tortili inferius, scabra; palea hyalina (5 mm. long., 1.2 mm. circ. lat.); apice denticulata, nervis carinalibus 0.5–0.8 mm. distantibus; rachillae articulo inter flores longo-piloso, articulo supra florem superiorem glabrato, saepius rudimento plus minusve abortivae floris terminato; antheris (1.4–1.6 mm. long.) linearibus; ovarii glabri stylis distinctis.

Distribution. CALIFORNIA: In the Sierra Nevada, Dinkey Creek, Fresno County, alt. 5300 ft. June 25, 1900, *H. M. Hall and H. P. Chandler*, No. 359 (TYPE in the Herb. of University of California; isotypes in the Herbarium of N. Y. Bot. Garden and at Gray Herbarium); near Donner Lake, Sierra Nevada, 1865, *J. Torrey*, No. 584; on trail to Campbell Lake, alt. 6000 ft. Cisco, Placer Co. July 29, 1908, *H. A. Walker*, No. 1500; "*Trisetum canescens*," Eldorado Co. alt. 9000 ft. Aug. 6, 1915.

Culm (30–90 cm. high) cespitose, erect at the base, bent at the tip; *leaves* velvety-downy: lower *sheaths* downy, the superior glabrate, loose; *ligule* (1.5–2 mm. long) pubescent, serrate-fimbriate; *blades* (4–10 mm. long, 2–2.5 mm. wide) plane or involute; *panicle* exserted (10–15 cm. long, 1–2 cm. wide), pale whitish green, shining, interrupted, at least at lower part, secondary branches ascending, projected, densely flowered from the base upwards; *spikelets* (6–7 mm. long) 2-flowered, laterally compressed; *glumes* unequal, ovate-lanceolate, ciliate on the keel, subequal to spikelet: I (5–5.2 mm. long, 1–1.2 mm. wide) 1-nerved, II (6–6.5 mm. long, 1.6–1.8 mm. wide) 3-nerved; *lemma* (about 6 mm. long, 1–1.2 mm. wide) glabrous, smooth, lanceolate, 5-nerved, 2-fid, with two bristles at the apex, awned dorsally on the upper $\frac{1}{3}$: *awn* divaricate (5–6 mm. long), scarcely twisted at the inferior half, scabrous; *palea* hyaline (5 mm. long, about 1.2 mm. wide), denticulate at the apex; *keels* (0.5–0.8 mm.) distant; *rachilla* long-pilose, terminal pedicel glabrate, often terminated by a rudimentary flower; *anthers* (1.4–1.6 mm. long) linear; *styles* distinct; *ovary* glabrous at the tip.

Discussion. It is impossible for the present to define with accuracy the geographical area of this Californian species, mistaken until recently for *T. canescens*, from which it is separated obviously by the interrupted panicle, shining, very pale, with short branches, dense; by the lemma, smooth, not scabrous; by the velvety sheen of the leaves and the ovary glabrous at the tip, and by the non-sessile stigmata. This plant, collected for the first time in 1865 by *J. Torrey*, was brought to the attention of *Burt Davy*, twenty years ago, who recognized it as a valid species, and gave to it an herbarium name.

16. **TRisetum disjunctum**, nom. n. *T. interruptum* Fourn., Mex. Pl. Enum., Gram. 108. 1886; not Buckley, Proc. Acad. Sci. Phila. 100, Febr. 1862.
17. **TRisetum mollifolium**, nom. n. *T. malacophyllum* Phil., Anal. Univ. Chil. 566. 1873; not Steudel, Syn. Pl. Gram. 229. 1854.

B. *Panicle spike-like, globose to narrow-cylindrical; branches very short; spikelets subsessile. . . H.*

H. *Glumes equal in length and in breadth.*

18. *TRISETUM SESQUIFLORUM* Trin., Bull. Sci. Acad. St. Pétersb. 1: 66. 1836.

Discussion. E. Hultén¹ places conditionally *T. sesquiflorum* Trin. as a synonym of *T. spicatum* (L.) Richt. with the following remark: "Quite glabrous specimens I have never seen and not one agrees completely with the description of *T. sesquiflorum* by TRINIUS, which acc. to him, should differ in having glabrous culm and leaves, one-flowered spikelets, equal glumes and awn attached below the middle of the lemma. The American specimens referred by TRINIUS to this species and preserved in Herb. TRIN. I consider to be *T. spicatum*. All Kamtchatka specimens I have seen labelled *T. sesquiflorum* belong to *Calamagrostis purpurascens* . . . As, however, none of them are labelled by TRINIUS, I do not know on what specimen TRINIUS founded his quotation of *T. sesquiflorum* from Kamtchatka."

The U. S. National Herbarium of Washington has a specimen from the Trinius herbarium, bearing on the label: "Ex herb. Trinii—Unalaska Mertens." Professor A. S. Hitchcock had the kindness to send to the Gray Herbarium, on our request, a few spikelets of this type, with the following description:—

"In *Trisetum sesquiflorum*, the ligule is long and the awn of the lemma is attached near the base. I found only one other specimen among our Alaskan material that corresponds with the type of *T. sesquiflorum*. This is Eagle, Alaska, A. J. Collier 64, June 29, 1902."

It is just as hard to confuse the spikelets of *T. sesquiflorum* with those of *T. spicatum* or *T. cernuum* as to confuse them with those of *T. Congdoni*.

But here is the difficulty. The Gray Herbarium has in its possession a plant from Unalaska labelled: "*Trisetum sesquiflorum*" with Bongard's autograph.² This last plant is specifically different from the type of the U. S. Nat. Herb. of Washington, coming directly from the Trinius Herbarium. Here are the differences noted in a comparison between both plants:—

¹ Hultén, E., *Flora of Kamtchatka and the adjacent Islands* 1: 116. 1927.

² Bongard's plants are those of Mertens. Cf. "Observations sur la végétation de l'Ile de Sitcha." 1833.

TRISETUM of the U. S. Nat.
Herb. (Mertens):

1. Lemma, 5 distinct nerves, prominent.
2. Awn attached "near the base," on the lower $1/4-1/3$.
3. Anthers 2-2.5 mm. long.
4. Nerves of palea 0.3 mm. distant.
5. Panicle shining; rachis glabrous.
6. Ligule 3 mm. long.

TRISETUM of the Gray Herbarium (Bongard):

1. Lemma, 5 distinct nerves, but not prominent.
2. Awn attached on the upper $1/2-1/3$.
3. Anthers 1.5-1.8 mm. long.
4. Nerves of palea 0.5 mm. distant.
5. Panicle not shining; rachis pubescent.
6. Ligule 1.5-2 mm. long.

Here is the original description of Trinius:¹

Trisetum sesquiflorum. Panicula thyrsode, densa; spiculis sesquifloris; glumis aequalibus; calli rhacheosque pilis brevibus; flosculo 4-aciculato, "medio 1" "paulo infra medium" genicutato-aristato; ovario nudo. Kamtch. Unal.

Trinius in describing his *T. sesquiflorum* had, no doubt, under his eyes more than one collection. Ledebour, in his *Flora Rossica*,² mentions, in fact, under *T. sesquiflorum*, the following collections: Hab. in Kamtchatka (Trin.) et in insula Unalaska (Trin., Bong.)! Ledebour seems to have seen only, like us, the material from Unalaska. So also E. Hultén, as we may deduct from the last line of the quotation just made. Is the type from Kamtchatka different from the two we know? If not, is it similar to the specimen of the U. S. Nat. Herb. or to that in the Gray Herbarium? Has it its awn attached near the middle of the lemma or "near its base"? To avoid all confusion, the writer adopts as the type of *T. sesquiflorum* Trin. the specimen in the U. S. Nat. Herbarium, as more conforming to Trinius' diagnosis. He proposes *Trisetum Bongardii* sp. nov. for the plant of the Gray Herbarium, and describes it thus temporarily:—

19. TRISETUM **Bongardii**, sp. n. A *T. sesquifloro* Trin. differt lemmate ad mediam vel ad tertiam superiorem partem aristato; paleae nervis carinalibus magis (0.5 mm.) distantibus; antheris (long. 1.5-1.8 mm.) brevioribus; ligula 1.5-2 mm. long.

Differing mainly from the typical *T. sesquiflorum* Trin. by the lemma awned at $1/2-1/3$ superior; by the nerves of the palea more (0.5 mm.) distant; by the anthers (1.5-1.8 mm. long) shorter; by the ligule 1.5-2 mm. long.

Distribution. ALASKA: Unalaska (*Bongard*), TYPE at the Gray Herbarium; *M. W. Harrington*, Oct. 2, 1871.

¹ Bull. Sci. Acad. St. Pétersb. 1: 66. 1836.

² Ledebour, *Flora Rossica* 4: 419. 1853.

20. *TRISETUM Williamsii*, sp. n. Culmo (30–40 cm. alt.) erecto, glaberrimo; vaginis laevibus; ligula 2.5–3 mm. long.; foliorum laminis rigidis, in nervis scabris, plus minusve involutis: laminis sterilium fasciculorum (15–20 cm. long., 2.5–3.5 lat.), his caulinis (6–10 cm., long., 3–3.5 mm., lat.); panicula dense spiciformi, angusta, cylindracea (5–6 cm. long., 5 mm. lat.); spiculis bifloris, opacis; glumis aequalibus, lanceolatis-ovatis (5.5–6 mm. long.), albidis, siccatis hyalinis, nervis flavis pallidis, non aurantiacis: I uninervia, II trinervia; lemmate (4.6–5 mm. long.) ovato, lato, paleam totaliter amplectante, apice bifido, subulato, 7-nervio, extremis duobus lateralibus nervis tantum infra distinctis, aliis breviter excurrentibus; arista (5–6 mm. long.) ad $\frac{1}{3}$ – $\frac{1}{4}$ inferiorem inserta, infra tortili, supra divaricata vel geniculata; palea (4–4.5 mm. long.) bidentata; carinis glabratis; rachilla, callo et rachillae prolongatione lateraliter abundantius villosis; antheris 2.8–3.2 mm. long.

Culm (30–45 cm. high) erect, glabrous; sheaths smooth; *ligule* 2.5–3 mm. long; *blades* rigid, scabrous, more or less involute; *panicle* spike-like, narrow-cylindrical (5–6 cm. long, 5 mm. wide); *spikelets* 2-flowered; glumes equal, ovate-lanceolate (5.5–6 mm. long), whitish, hyaline when dry, nerves pale yellow, not glossy; *lemma* (4.6–5 mm. long) broad-oval, enveloping, 2-fid, subulate, 7-nerved: nerves excurrent, except for the two outer extreme ones, which do not reach the margin of the lemma; *awn* (5–6 mm. long) inserted on the lower $\frac{1}{3}$ – $\frac{1}{4}$, twisted in its inferior half, geniculate or divaricate; *palea* (4–4.5 mm. long) 2-dentate, glabrate; *callus*, *rachilla* and its terminal pedicel laterally dense-villous; *anthers* 2.8–3.2 mm. long.

Discussion. The above description is based on normal flowers, not parasitized.

Here are the essential differences between:

T. ALASKANUM Nash.

spikelets shining, red-orange nerved;
lemma 5-nerved;
palea with scabrous keels;
awn not or but slightly twisted on its lower part, inserted on the upper $\frac{1}{3}$ – $\frac{1}{4}$ of the lemma;
terminal pedicel with very rare hairs;
anthers 0.8–1 mm. long.

T. WILLIAMSI Louis-Marie.

spikelets non glossy, pale-yellow nerved;
lemma 7-nerved;
palea with keels slightly ciliate;
awn very twisted on its lower part, inserted on the lower $\frac{1}{3}$ – $\frac{1}{4}$ of the lemma;
terminal pedicel with abundant and long hairs;
anthers 2.8–3.2 mm. long.

H. *Glumes subequal in length, markedly unequal in breadth.*

21. *TRISETUM oreophilum*, sp. n. Robustum (50–80 cm. altum),

inferius decumbens; vaginis inferioribus pubescentibus, superioribus glabriusculis, in margine superposita sparse longo-pilosis; ligula (3-4 mm. longa) laciniata; laminis foliorum (10-16 cm. long., 2-4 mm. lat.) scabris, glabris vel pilosis, praecipue juxta basim in margine; panicula 8-15 cm. long., 1.5-2 cm. circ. lat.) cylindracea, lobata vel inferius interrupta, viridi, purpureo et argenteo plerumque variegata; spiculis 2-3-floris, lateraliter compressis (4 mm. circ. long.), eorum pedunculis arachnoideis-pilosis; glumis subaequalibus: I (2.6-3.6 mm. long., 0.8-1.2 mm. lat.), II (3.6-4.2 mm. long., 1.2-1.8 mm. lat.) acutis, scabris dorsaliter, saltem superius, non subulatis neque setulatis; lemmate (5 mm. long., 0.8-1 mm. lat.) lanceolato-angusto, densa, alba pilositate vestito, nervis indistinctis, aristato ad $\frac{1}{3}$ superiorem; arista (3 mm. circ. long.) saepius non recta, non inferius tortili neque geniculata, sed diverso modo recurvata; palea (4 mm. long.) lemma aequante, apice dentata, carinis 0.6 mm. distantibus, dense ciliolatis; rachilla, callo et prolongatione pedicelliformi sparse et breve pilosis; antheris 1.2-1.6 mm. longis.

Vigorous plant (50-80 cm. high) decumbent; the inferior sheaths pubescent, the superior ones more or less scabrous, the over-lapping margin ciliate; ligule (3-4 mm. long) lacinate; blades (10-16 cm. long, 2-4 mm. wide) scabrous, glabrous, pilose at the base on the margin; panicle (8-15 cm. long, 1.5-2 cm. wide) cylindrical, lobed or interrupted at the base, silvery-green, ordinarily purplish; spikelets 2-3-flowered, laterally compressed, on peduncles arachnoid-pilose; glumes subequal: I (2.6-3.6 mm. long, 0.8-1.2 mm. wide), II (3.6-4.2 mm. long, 1.2-1.8 mm. wide) acute, dorsally scabrous towards the apex, neither subulate nor setulate; lemma (5 mm. long, 0.8-1 mm. wide) narrow-lanceolate, densely pilose, indistinctly nerved, awned at its superior $\frac{1}{3}$: awn (about 3 mm. long) not twisted, not geniculate but diversely bent; palea (4 mm. long) equal to the lemma, 2-dentate; keels 0.6 mm. distant, densely ciliate; rachilla, its pedicel and callus lightly pilose; anthers 1.2-1.6 mm. long.

Distribution. ECUADOR: Turubamba near Quito, *Sodi*, s. j. 1890, 1893; Pichincha, *Sodi*, 1893. The material from Ecuador is not very typical. PERU: Cuzco, moist grassland, high up ravine above Olloutaytambo, Alt. 3600 m. Dec. 5, 1923, *Hitchcock* 22535 (TYPE at the U. S. Nat. Herb.), *Hitchc.* 22471; Palca, La Paz, *Hitchc.* 22563, 22294, 22323, *E. W. D. & Mary M. Holway* 478; Goyllarisquisca, Cerro de Pasco (Junin) *Hitchc.* 22271, 22254 (alt. 4200 m.), 22269. *Hitchc.* 22199 has a subglabrous lemma. BOLIVIA: *Buchtien* 6468; *Asplund* 6497 (alt. 4600 m.), 6476.

Remark. Very homogenous species, contains nearly all of the

collections of "*T. spicatum*" of Ecuador, Peru and Bolivia of the U. S. Nat. Herbarium of Washington. *T. oreophilum* is more closely related (by its villous lemma and its habit) to *T. Rosei* than to *T. spicatum*, as the writer sees them after a careful study of the type (Cf. discussion of the type of *T. spicatum*).

(*To be continued*)

SOLIDAGO FLEXICAULIS AND SOLIDAGO LATIFOLIA

KENNETH K. MACKENZIE

IN 1753 (Sp. Pl. 2: 879) Linnaeus published his *Solidago flexicaulis* and immediately following on the same page his *Solidago latifolia*.

His description of *Solidago flexicaulis* is as follows:

"7. SOLIDAGO caule flexuoso, foliis ovatis acuminatis serratis, racemis lateralibus simplicibus. *Roy. lugdb.* 161.

"Virga aurea montana, scrophulariae folio. *Pluk. alm.* 390. t. 235. f. 3.

"Virga aurea canadensis, asterisci folio. *Herm. par.* 244. t. 244.

"*Habitat in Canada.*"

Both plates cited illustrate the plant treated by Britton & Brown (Ill. Fl. (ed. 2) 3: 383 f. 4216) as *Solidago flexicaulis*, and the Royen reference refers to the same plant. Notwithstanding that Linnaeus in no way referred to or cited any herbarium specimen of his own, Gray (Proc. Am. Acad. 17: 178-9. 1882) insisted on dropping the name, merely because he found a specimen of *Solidago caesia* L. labeled as *S. flexicaulis* in the Linnaean herbarium. And this although the Linnaean herbarium is full of incorrectly labeled material. Since Gray's time it has developed that the specimen seen by him was not in the Linnaean herbarium in 1753 (Jackson, Proc. Linnaean Soc. 1912, Supplement 139) and hence it has no claim at all for consideration in dealing with *Solidago flexicaulis*. The name then is properly used as by Britton & Brown and the species represents no mixture at all.

The original description of *Solidago latifolia* is as follows:

"8. SOLIDAGO caule erecto, foliis ovatis acuminatis serratis, racemis lateralibus simplicibus.

"Virga aurea, latissimo folio, canadensis glabra. *Pluk. alm.* 389. t. 235. f. 4.

"*Habitat in Canada.* 4